

ECOSYSTEM SERVICES AT MAGYARCSANÁD SITE AS PERCIEVED BY LOCAL PEOPLE

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Project objectives

The objective of the study discussed in this paper was to investigate and assess how local stakeholders perceive the natural environment they live in, what they find valuable and important for their "well-being" and life. The theoretical background of this valuation was the concept of ecosystem services. According to one of the most popular definitions, ecosystem services are the benefits human populations derive, directly or indirectly, from natural and human-modified ecosystems (MEA 2003). Thus the concept of ecosystem services describes exactly what we wanted to understand through our research: the importance of nature to a local community and the ways local people and their communities can benefit from their environment.

The area of the research

Geographical site description

Two study sites were chosen for developing a habitat evaluation system and assessment of ecosystem goods and services in the HURO/0801 program. One of these sites is along the River Maros, near to the Hungarian villages Apátfalva and Magyarcsanád. The study was focused on the floodplain, the area between the dike of flood-protection and the river bed. The width of the floodplain is quite wide here, about 2500 m.

The climate of the area is continental: mean annual temperature is 10,8oC, annual precipitation average is 567 mm and solar radiation is 2100 hours per year. This mesoclimate is modulated by the hydrological factors and by the vegetation. (Marosi and Somogyi, 1990). The hydrological character of the studied area is determined by the River Maros (Fig. 1). The river runs in its original, natural bed until it reaches Apátfalva. The river forms a large curve between Bökény and Apátfalva. The water dynamic of the river depends mainly on the hydrological events in Romania, and affected by the water level of River Tisza as well. The high water and flood usually comes in spring or in June, and the water level of the river is the lowest in September and October. The flooding period is not so long and the flooding level is not so high in the Maros floodplain as it is in the case of

Tisza. The studied area is on the higher level of the Hungarian Maros section, so the agriculture is only slightly endangered by floods (Oroszi, 2009).



Figure 1. Present situation of the studied area near the villages Apátfalva and Magyarcsanak. The border of Hungary and Romania is along the River Maros. Source: google earth

Accelerated overbank aggradation was measured along the Maros River as a result of mid 19th century regulation works. Due to these works the meanders of the lowland Maros River were cut off, the channel became straightened. Within 50 years the cut-offs made during the regulation works silted up. Since natural widening became dominant, it produced extra amount of sediment input for the Maros River which is characterised by great sediment discharge. The accelerated overbank sedimentation was especially intensive in front of the alluvial fan, where a secondary alluvial fan was built (Kis *et al.* 2010)

There are young alluvial soils on the floodplain area, but on the saved-side of the dikes there are mould soils, it is very good for agriculture.

Ecological description

A complex landscape-use (mosaics of arable lands, orchards, grasslands, and forests) preserving the marks of the smallholder landscape-use is characteristic on

the Maros floodplain, at Apátfalva and Magyarsanád. On the lower part of the river floodplain, near Szeged, planted forests and large-plot dominated landscape can be found, containing less habitat-patch and type (Deák 2010).

It is difficult to separate the natural and artificial habitats because the cultivated meadows and planted forest have some natural character, and even the arable fields are abandoned for some years, and ploughed again later.

The following natural vegetation types (habitats) can be found on the River Maros floodplain (Deák 2010):

Relatively common types:

floodplain meadows,

willow-poplar woodlands

oak-elm-ash alluvial forests,

annual wet pioneer vegetation

willow-shrubs,

extensive floodplain orchards

reeds and the floodplain *Bolboschoenus* dominated swamps

Less common types:

saved-side secondary saline landscapes,

lag-surfaces of high floodplains

habitat-complexes of the mosaics of non-saline grasslands, paleopotamals
and forests

saved-side and active floodplain's oxbow lakes

navvy-holes

Rarely occure:

sedgefields,

Glyceria, *Butomus*, *Eleocharis*, *Alisma*, *Oenanthe* dominated swamps,
eutrophic reed-grasses

The botanical studies described the presence of 645 plant species, 20 protected species among them. The most important species are: *Iris spuria*, *Vitis silvestris*, *Lythrum tribracteatum*, and *Potamogeton filiformis* (Paulovics 2002).

The floodplains are endangered by invasive plants everywhere in Hungary. The lower Maros floodplain is invaded strongly by *Acer negundo* and *Amorpha fruticosa* and in lesser degree *Fraxinus pennsylvanica*. The closed native forest, the long lasting surface water or continuous grazing or moving could stop its spreading and dominance.

The fauna of River Maros floodplain is much more less revealed than the flora. Only the Gastropoda Coleoptera, Lepidoptera and Aves are quite well

studied. The saved and flooded part of the floodplain and the river bed as a habitat complex only together guarantees the survival of animal species. Several protected fish species were found in the river. The most valuable bird species are *Charadrius dubius*, *Pernis apivorus*, *Ciconia nigra* and 22 other strictly protected species, and 7 bat species are also described (Paulovics 2002).

The history of land use

There is a detailed study about the history of land use in this book (see Fodor *et al.*, 21-32 pages), we present a short summary here, it is necessary to understand the present situation of ecosystems.

In the middle ages the Maros valley was densely populated, but this culture was destroyed during the Turkish occupation. Most of the ruined villages have never been rebuilt.

Apátfalva used to be surrounded by a large pasture in 1784 (First Military Survey), and there were orchards and gardens as well at that time there (Oroszi 2009). Csanád is a very small settlement, but not in the present position. The river is braided, forms islands in their bed. There are some forest patches near the river (Fig. 2).

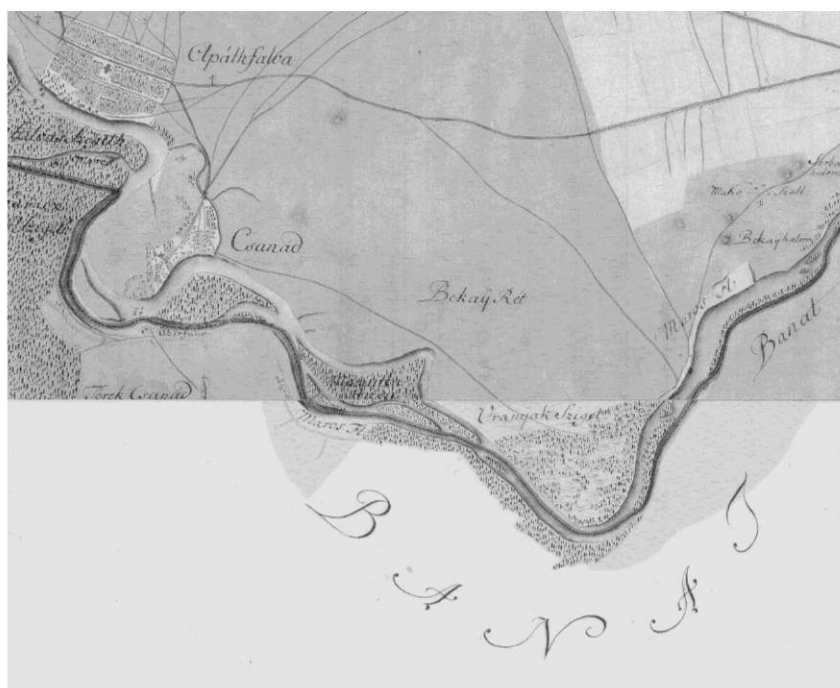


Figure 2. The studied area in 1784 Source: First Military Survey, Col.: 20 Sec.: 30

The neighborhood of Apátfalva is a large pasture. Forest patches are near the river, arable land is only several km to the east from the village.

A great flood destroyed a street in Apátfalva in 1820, consequently the river regulation started after this event. Dikes were built and certain meanders were cut off (Oroszi, 2009). Several cutoff can be seen on the map from 1864, but the river flows mainly in the old bed yet (Fig.3). The village Magyarcsanak was built this time, the extent of the settlements is similar to the present state. The grasslands were ploughed only in small patches, near to the villages, the border of the pasture and arable land is in the previous position. The eastern half of the grassland is indicated to wet meadow (blue color on the map). Forests are only in the large curve of the river, forming a mosaic with wet meadow patches. Larger forests are on the left side of the river (Grosz Szt. Miklöser Wald).

Later most of the grassland were ploughed around the villages, but between the dikes of flood-prevention and the river (on the present floodplain) several hundreds of grasslands remained until now.

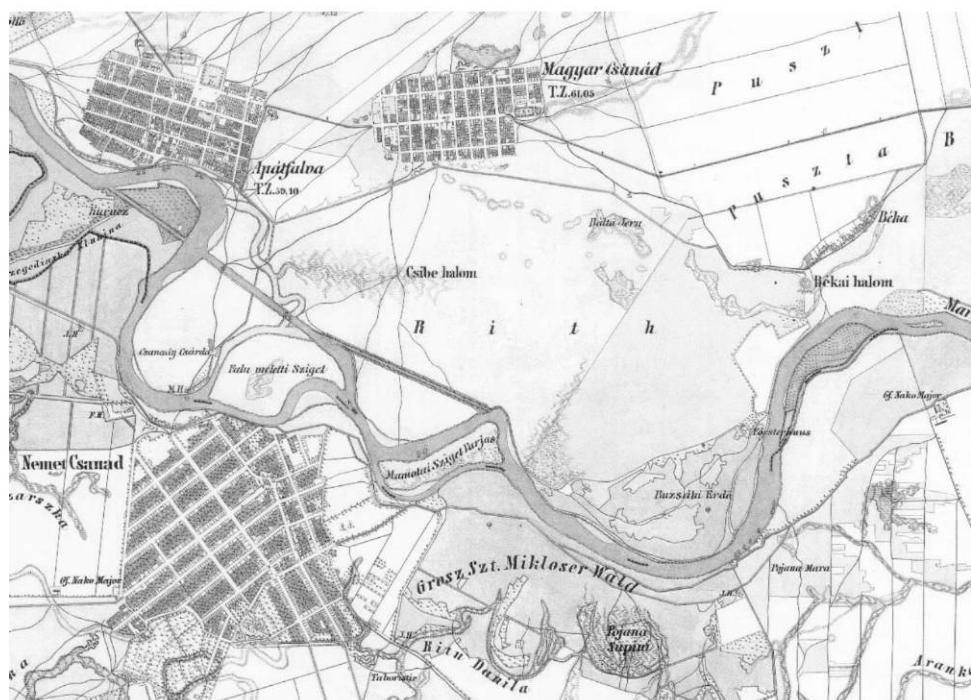


Figure 3. The studied area in 1864. Source: Second Military Survey Coll.39, Sec.: 62.

Land use during the socialist period (between 1945 and 1990)

During the socialist period the floodplain was managed mainly by a cooperative. A hybrid poplar plantation was developed on the half of the floodplain area, and the other half was arable land and grassland in 1:1 area rate. The pattern of the land use types was similar to the present situation. The arable land was cultivated intensively, using chemicals, fertilizers and large machines. An extensive channel system was built and the fields were irrigated from the River Maros. Mainly vegetables (turnip and garlic) and fruits were produced. The grasslands were managed intensively as well, using fertilizers and irrigation. After a very early mowing a large number of grazing animals (horses, cattle, sheep and pigs) were grazed here successively, altogether about 2000 animals on about 300 ha grassland area. The natural forests in the large river curve were cut down, and small scale arable land parcels and private gardens were developed here. Hybrid poplar were planted on the place of wet meadow.



Figure 4. The most of the floodplain is nature protected, belongs to the Körös-Maros National Park (crosshatched). Source: Nature Conservation Information System (www.termeszetvedelem.hu)

The cooperative survived until 1997, and this is the year of the foundation of the Körös-Maros National Park (Fig. 4). So, the privatization of lands did not

occur here, the national park took over the management of the area directly from the collective farm. Most of the floodplain between the dikes and the river remained in state ownership. After 2004 the area belongs to the Natura 2000 ecological network.

Evaluation method

There are several methods currently in use in social sciences to evaluate the role of ecosystem services (and the role of nature in general) in human societies. Monetary valuation providing cost-benefit analysis can be regarded as the most popular one in environmental economics (Hanley and Spash 1993). The theoretical basis of these methods lies in neoclassical economic theory. These methods deduce the value of ecosystem services from individual benefits. The popularity of the method is indicated by the fact that ecosystem services have also been valued on a global scale in such a way in 1996 (Costanza *et al.* 1996).

Certain methods of cost-benefit analysis and the monetary valuation of natural resources are criticized both by neoclassical environmental economists (Marjainé Szerényi 2000, 2005) and by the followers of competing economic paradigms, mainly ecological economics (Gowdy 1997, Málovics-Bajmócy 2009).¹

Regardless to our position in the debate about nature's monetary valuation, the aim of our research (to explore and understand) demanded the use of alternative methods, because of the following reasons. According to the neoclassical paradigm valuation methods (especially conditional valuation) applicable in the monetary valuation of natural resources are quantitative methods. Such methods provide a generalization related to the most important explanatory variables related to certain phenomena, instead of providing an in-depth explanation of those (e.g. Why is natural environment important for certain communities?) (Babbie 2008). To understand social phenomena qualitative techniques are needed, such as in-depth personal interviews and focus group interviews.

To achieve our research objectives we have chosen qualitative methods because of the issues described above.² During the research that took place between the summer of 2010 and January 2011 altogether 28 in-depth semi-

¹ Further reading about the critique of nature's the monetary valuation can be found in CONCERTED ACTION: Environmental Valuation in Europe (EVE) project: <http://www.clivespash.org/eve/publ.html#SJI>

² This doesn't mean that qualitative methods are the best option to achieve our research objectives. It is possible that certain participatory approaches (e.g. Cornwall and Jewkes 1995, Aldres and Jacobs 2000, Gomez *et al.* 2011, Munté *et al.* 2011) would be more suitable for the same purpose. However, applying these methods would reach far beyond the financial, human and time constraints of the project.

structured interviews were conducted with local residents and land users about the ecosystem services they perceive. Economist and ecologist students of the University of Szeged participated in the research after a short university course where they received a training about the principals of social science research methods, particularly qualitative interviewing. The survey was carried out in three phases from the summer of 2010 to January 2011. Working in pairs and in groups of three 28 semi-structured interviews were made with local farmers, members of NGO-s, teachers, hydrology and conservation specialists, and officeholders.³ We have chosen semi-structured interviews because (1) this method has already been proven to be suitable in exploring and understanding the opinion of local people about nature in previous researches (Kelemen *et al.* 2009, Malovics and Kelemen 2009), and (2) because it allows unexpected observations which was important for us because of the explorative nature of the research.

The first round of the subjects was selected with the guidance of the national park service ranger and using the snowball sampling method further subjects were chosen with the help of the previous ones. Most of the interviews were carried out in Apátfalva and Magyarcsanak, but interviews were made in Bökény and Csanádpalota as well.

One of the serious problems that may occur in a social study is that stated preferences (what people tell in a survey) may differ significantly from revealed preferences (what people really think about certain subjects or how they would really act in certain situations) (Babbie 2008). Thus we paid special attention to formulate questions that do not remind our subjects directly of the field of environmental protection and nature conservation. We did so knowing that today environmental protection and nature conservation have become social expectations, so in a survey where subjects are aware of the green aspect of the research, the stated and revealed preferences are very likely to differ. Stated preferences will appear greener than revealed ones (Kelemen and Gómez-Baggethun 2008).

The following topics were discussed during the interviews depending on the subjects' occupation, current situation, options and prospects in life (see appendix for the detailed interview scheme):

- Life and work of the subject. Local life options, farming possibilities.
- Natural values of the area.
- Changes of the natural environment.

³ This amount of interviews is considered sufficient in a "traditional" social study but similar studies (e.g. Kelemen *et al.* 2009) may produce a significantly higher number of interviews.

Notes have been taken during the interviews continuously instead of sound recording because according to our previous experiences a significant part of our subjects might find the latter one "intimidating": they were able to talk in a more open and free way when they knew that their voice was not recorded. Therefore when quoting an interview we refer to our notes and not recordings. The interviews are indicated with codes V1-V28, each code indicating a different interview.

Results

Inventory of the ecosystem services perceived by locals

Table 1. Ecosystem services in functional alignment

Provisioning services	Food Fodder Energy source, fuel Timber or other raw materials Biochemicals, natural medicines and pharmaceuticals Genetic resources Ornamental resources
Regulating services	Air quality regulation Climate regulation Water regulation Flood protection Erosion regulation Regulating species reproduction Break down of pollutants Pollination Pest control and disease protection Storm protection Protection against noise and dust Biological nitrogen fixation Conservation of nature and biodiversity
Cultural services	Cultural, historical and spiritual heritage values Scientific and educational services Recreation and ecotourism Aesthetic values Other cultural or artistic information, inspiration „Sense of place”
Supporting services	Soil formation Nutrient cycling Primary production

Source: MEA 2005, Hein *et al.* 2006

The typology of ecosystem services used in the research was developed based on the Millennium Ecosystem Assessment (2005) distinguishing four types of services: provisioning services (e.g. food, raw materials, fodder), regulating services (e.g. climate regulation, protection against floods, pollination), cultural services (e.g. education, recreation, artistic inspiration) and supporting services (MEA 2005) (Table 1). Due to recent criticism of the evaluation of supporting services (pl. Hein *et al.* 2006) we avoided dealing with them in this survey.

Provisioning services

According to our interviews it has become clear about the ecosystem services perceived by locals that key importance was given to provisioning services by nearly all subjects (and not only by farmers). When talking about food production the importance of production of field crops, vegetable cultivation and fruit production is highlighted and the excellent local agricultural potentials are emphasized.

„Crops, fruits, vegetables and greenery horticulture are typical here. We have a countrywide good quality soil.” V9

„Soil is excellent in the area. On the Hungarian side of the river Maros soils yield very well and... natural features are very suitable for agriculture. Corn, wheat, oat are produced. Onion and garlic have become widespread too. Parsley is also typical.” V17

„People mostly produce vegetables: onion and parsley. To a smaller extent livestock farming is also present: farmers produce fodder on their own lands and they mostly keep pigs. But they rather cultivate plants. In the past sugarbeet too, but now it's gone. There is sunflower, corn, wheat, oat, but no rape is produced. Parsley is just called "gyökér" (root) here. Other than that, more carrot and onion is produced here than garlic, that's rather done in Makó. Vegetables are delivered to Dorozsma, Budapest for seasonal grocery sales, but throughout the whole year as well. Washing and packing all seasons: from the frozen soil, outside in the cold, it's a tough job. Prices are unstable, it's only worth on the long run and only on a big land.” V18

„There is little uncultivated land in the area. Mostly onion, parsley, paprika and tomato are produced. Tomato production is based on thermal water... There are small gardens in the flood plain where people grow vegetables... but due to the generation swift there are less and less vegetable gardens in the floodplain...” V7

„Floriculture is not present in the area. Fruits are typical, plum particularly, but it is disappearing, because cedars take over as people from the cities move in the area. It is a pity since the local plum pálinka is delicious and can have up to 40-50-60 percent of alcohol content.” V20

In the past livestock production used to be an important ecosystem service besides plant cultivation in the area. By today it has lost its significance due to loss of market according to the locals. Very few locals do it for a living, animals are kept mostly just for the household.

„Three kind of land use can be found in the area: ploughland, grassland and forest. Grasslands have been grazed but since the sixties and seventies the number of livestock has fallen. János Gyenge has a herd grazing in the area and the national park has a herd of 100 Hungarian grey cattle.” V1

„We used to have pigs too, we had about 100, also cows, horses, but not anymore.” V3

„Livestock farming got ruined mostly because prices were pushed down and everything comes from abroad.” V12

„My animals are: sheep and goats: 50 and also 3 cows, 15 pigs, 2 horses.” V19

„We used to do farming. I used to be the cook in the kindergarten and my ex-husband used to work for the agricultural cooperative with fodder processing. We used to have a homestead where we produced parsley. We had two cows and one bull. We took the milk to the milk collecting station every day, a litre costed 3 forints. Things went on like this between the sixties and nineties when we finally gave up farming... We used to grow corn and used to feed it to the pigs, we had 40 each year. We had one brood sow and we sold the piglets. Today, there are just two houses left where they keep pigs. We still do it, but these are slaughtered at an other house for us. We just keep them for our own consumption.” V2

Besides agricultural production fish and game is a provisioning service mentioned frequently. According to the subjects fishing has lost much of its significance lately while hunting remains an important source of income.

„There is a hunting association that belongs to the city of Makó. They organize battues every autumn. You can shoot hare, pheasant and wild boar or deer too.” V2

„The hunting society provides a source of living ... The area of the hunting ground is 1800 hectares. 30% of the society's income comes from hunting. In the past they used to breed pheasants as well.” V5

„The vicinity of the village is primarily an agricultural area. Two hunting societies hunt here: one from Makó and one from Magyarsanáád. Their areas border on each other here. They hunt for pheasant, fox, hare, roe deer, duck and goose in the grasslands of Beka. There are hunters from abroad, too, mainly Italians.” V18

„Hunting tourism is also present. Fishing on river Maros is a rarity.” V7

„There are two fishermen working in both Apátfalva and Nagylak. When the water is high they may catch fish as long as a meter, but they say that there used to be more fish in the river Maros and that the number of fishes has fallen

significantly lately. There is a hunting association in Magyarsanád, hunting is more typical in Bökény.” V9

„There is an increasing amount of precipitation causing a lot of problems. River Maros is a natural border between Romania and Hungary. The biodiversity of the river and its surroundings is on a constant decline. Fishing has fallen back because there is barely any fish in the river. It's almost not worth to get the fishing license.” V12

„Fishing is present on the river. There is a self-employed fisherman earning his living with it, he doesn't complain. He works on a 2 kilometers long section with good results. There is perhaps one more person but he doesn't make a living with it, he just earns a little extra.” V18

Sources of renewable energy are mentioned by several subjects, mostly biomass (wood) and the geothermic energy used in agricultural production.

„Subsistence crime is high, a lot of people steal wood.” V1

„Gas is generally used for heating but it is expensive. So a lot of people switched to different sources of energy: wood in iron stoves is increasingly popular. Most of the firewood comes from Romania on trucks but there is a privately owned timber yard too. Unfortunately a lot of wood stealing occur on the flood plain. It's mostly done by poor people who don't have enough money to buy wood. To keep the stealing low certain areas are designated for cutting, the fallen wood found here can be collected by anyone...” V18

„Greenhouses are heated by thermal water.” V1

„There is not much uncultivated land in the area... tomato is cultivated in greenhouses that are heated by thermal water.” V7

„Besides heating greenhouses there are plans about using thermal water for other purposes as well, for example developing tourism around it.” V18

Many locals have mentioned the high natural potential of the flood plain. This is a provisioning service related to genetic resources.

„The Bökényi-öblözet has a high natural potential. It has been improving especially in the past 5 years thanks to planting wood.” V1

„Red deer, golden jackal, white-tailed eagle and wild boar can be found on the flood plain. Red deers swim from Romania in the river Maros... It's important to protect bee-eaters and the rare snail called *Drobaica banatica*. We have to take care of deers, pheasants and hares because the highway is close and some use very strong poison.” V5

„I love nature, I'm connected to it since my early childhood. I'm a big nature fan. Biodiversity is something that I find important, I love birds and butterflies, snails... We have to protect nature! Nature needs space... Punishment should be a lot stricter.” V14

„There is some kind of a rare protected plant species living on the grasslands of Beka, but I don't remember its name. British botanists were looking for it here. And there are some rare fish species in the river, for example sterlet.” V18

Fodder production used to be a more significant provisioning service, by today it has fallen back with the decline of animal husbandry.

„The area is characterised by three kinds of land use: ploughland, grassland and forest. Grasslands have been grazed but since the sixties and seventies the number of livestock has fallen. János Gyenge has a herd grazing in the area and the national park has a herd of 100 Hungarian grey cattle.” V1

„In Újfalu houses have been built around '58-'60. The place called "Tehénjárás" is in that area, we used to have some land there. There used to be about 500 herds in the village, today there is about 5.” V2

Besides the provisioning services listed above, honey and drinking water are mentioned and also biochemical, medical resources.

„I have more than a hundred colonies. I check them almost every day.” V22

„In the past people used to take their drinking water from the river Maros. Today it is polluted. An old lady in our village only used to drink the water of the river Maros in her entire life.” V2

„The mud of the river Maros is well known for its healing effects. It is used against aching legs. A woman from the village used to walk to the river and cover herself with mud. In Makó it can be purchased in the shop. It is also used in the Makó Bath.” V2

Regulating services

The interviewed people talked relatively little about regulating services and there were few regulating services mentioned at all during the interviews. Such regulating services are flood protection, protection against erosion, safeguarding species reproduction, nature conservation and protection of biodiversity – as shown by the quotations below.

„It was good, that there were willow trees at the River Maros, they mitigated the flood effect,... The cooperative has planted willow, black nut and poplar trees on the floodplain, they can protect against the high water, waves, soil erosion, but they were used for wood production as well.” V10

„The floodplain at Bökény has a high natural potential. It has been improving especially in the past 5 years thanks to planting wood.” V1

„Red deer, golden jackal, white-tailed eagle and wild boar can be found on the flood plain. Red deers swim from Romania in the river Maros... It's important to protect bee-eaters and the rare snail called *Drobaica banatica*. We have to take care of deers, pheasants and hares because the highway is close and some use very strong poison.” V5

„There are smaller islands on the river Maros. They are called "vesszős porond" and originate from fallen parts of the shore or are built by the river.

Willows grow on them and many interesting birds can be found there: little egret and night heron.” V18

Cultural services

All categories of cultural services described in the literature were mentioned by our subjects. The ones that got most attention (highest number of times mentioned) were cultural, historical and religious heritage as ecosystem service. They talked about the disappearing farmsteads ("tanya", a typically Hungarian kind of farmstead). The subjects also mentioned other cultural and spiritual heritage values of the natural environment.

„Everything related to people has changed a lot: the world of isolated farmsteads is disappearing. One of the reasons were the forced deportations of the seventies.” V7

„There used to be more than 400 fams (tanya) here. They have disappeared with the cooperative.” V20

„The number of farmsteads has dropped drastically in this area. There used to be hundreds of "tanya" in the vicinity of Magyarsanád and Apátfalva, most of which was still populated in 1960 but today there is only 3 of them left. In the past the area around the farms was kept in order. People planted black locust around them and they used it in several ways. Today they are not taken care of.” V17

„Whether the hill in Beka is a kurgan, a burial mound or a motte remains a mystery. There have been archeological excavations and findings too. There were excavations on the river bank too with findings of the peasant uprising of Dózsa. Around Káposztás there is a vertical segment of the river wall, the findings were there... There is a stone cross on the hill in Beka. There are several legends about it. The cross itself stands two meters high above the ground but its full lenght is about 4 meters high. It was brought from the Southern Carpathians. People refer to it as the „Belezi nagykörösz” (big cross of Belez). Belez was an ancient settlement, there have been excavations when the road was built. There are several legends about the cross. According to one of them a medieval tournament was held there and the winner raised the cross to the memory of the looser of the game. An other legend says that this was the place where Dózsa was burnt and buried. Some think that László Kun was buried there. None of these stories is very likely, they are just legends.” V18

„There are several values in the village that should be protected. For example the gables of the houses. Or the 200 year-old oak tree whic was planted for the millenium and gave it's name to the „Oak Tree School”. Other small schools have also been named after trees, besides this one. The church of the village should also be protected, although it isn't a museum piece, it's old.” V20

Recreation and tourism are mentioned frequently, too. River Maros and the surroundings serve as a beach and it is used for hiking as well. A forest school has

opened recently, hunting and the rural environment also make this place suitable for tourism.

„There is a sandy area along the bank of the river called „Lúdvár“, we go there to have a bath and swim. Water is warm and clean there, you can even see the bottom of the river.” V2

„The main characteristic of the village, the main attraction is popular tradition: the river is not so important. The river Maros is not as related to everyday life as it used to be.” V7

„The river Maros is the most important natural value. We used to spend days by the river with the kids each summer. I can't imagine my life without the trees surrounding river Maros that also provide clean air.” V12

„There are many hiking routes in the area, for example from the village to Bökény there is a 15km long walking route. I walk it too on a regular basis.” V18

„The bank of the river Maros and its surroundings is becoming popular: people go there to hike, to have a picnic... The river isn't really polluted, it would be nice to have a good beach. There is an illegal beach at Lúdvár. The river builds sandbanks there popular among swimmers and anglers as well. People make bonfires to cook and fry meat and have a picnic there.” V18

„We keep looking for other sources of income: we have opened the forest school that has become self-sustaining and rural hospitality is on the rise, people feel motivated in this.” V7

„Some try to pioneer rural hospitality. An old cottage has been transformed into a guest-house, hunters usually stay there. There are some regular guests too, for instance those working in the neighbourhood” V18

The third one is a cultural service mentioned by several subject: the so called sense of place ecological service.

„My ex-mother-in-law used to respect nature so much! Whenever she went out to the island she gave a hug and a kiss to the walnut tree... We love it here. I couldn't imagine my life anywhere else anymore.” V2

„We are very keen on the river Maros but it is not being taken care of and it's polluted.” V3

„Farming is a forced solution, because I wanted to stay here. We are so used to living here. Maros and the closeness of the fields and nature gives the magic of this landscape.” V8

„The river Maros is the most important natural value. We used to spend days by the river with the kids each summer. I can't imagine my life without the trees surrounding river Maros that also provide clean air.” V12

Besides the above some subjects mentioned scientific and educational services, aesthetic values and other spiritual and artistic inspiration.

„The Szigetház forest school has been operating since 2000. The old building of the socialist party headquarters has been transformed for this. The program of

the forest school consists of 2 parts. One is about nature and the other one is about tradition.” V20 pensioner, Apátfalva

„The river Maros defines the landscape, the river bank, the flood plain. It is a significant value, I have taken a set of photos of it too: the most beautiful corners of the floodplain in each season.” V18 teacher, Apátfalva

Thus according to our research locals primarily perceive the provisioning and cultural services that affect their lives the most directly, these are the ecological services they find the most important. The most important provisioning services are the ones that affect the livelihood of the community directly: services related to food production. The most valued cultural services are tourism, recreation and sense of place.

A conflict related to the conservation program of the Körös-Maros National Park (KMNP)

Although the original aim of our research was „only” to explore and understand the way our subjects value and think about nature we have „bumped into” a local conflict that is worth mentioning. Especially because it appears to be a quasi-typical conflict in Hungary, as previous researches have explored similar conflicts regarding conservation projects in the near past in Hungary (Bodorkós and Mertens 2009, Kelemen *et al.* 2009, Málovics and Kelemen 2009).

Description of the conservation program⁴

As it was mentioned above, the Körös-Maros National Park Directorate (KMNP) took over the management of the area directly from the collective farm in 1997. Most of the floodplain between the dikes and the river remained in state ownership, and in nature conservation management. After 2004 the area belongs to the Natura 2000 ecological network. The KMNP has different management plans for different land use types, as grasslands, forest, arable lands, orchards, and they are involved in hydrological management as well.

The extent of the grasslands is about 300 hectares in the studied area. This is a special situation, because most of the Maros floodplain is used for forest plantation, so this large floodplain grassland is an important natural value. The main goal of the conservation management is to maintain the natural values by moderate grazing, but the number of grazing animals decreased drastically after 1990 here, as it happened in the whole country. A local farmer has 150 cows here now, and other two farmers has 60 and 40 sheep respectively. The private farmers rent the pasture from the national park. They have to use the pasture according to

⁴ The information about the management goals and activity of the national park mainly comes from from a staff member of Körös-Maros National Park who is the leader of conservation management in the area.

the conservation rules, described in a contract. The base of the regulation is the national rules about the Natura 2000 grassland management. The national park has a herd of gray cattle (about 300 animals) in the Csanádi puszta (about 25 km from here). If the alkali pasture dries out there in late summer the herd is transported to the floodplain grasslands by truck.

The main goal is to develop a seminatural forest in the place of hybrid poplar plantation. The plantation was cut down, and the area were divided into 3 ha units. Native gray poplar and Hungarian ash saplings were planted, and oak seeds were sown. If the forest authority accepts the new forest the conservation manager plan to introduce other native tree species increasing the species diversity of the forest. Such forest establishment is rather unusual, the conservationist planned it exclusively for this area. Some dangerous invasive plants as *Acer negundo*, *Amorpha fruticosa* and *Fraxinus pennsylvanica* are abundant here. The only way to confine them to establish a dense natural forest or permanently managed grassland.

Maintaining of arable land is not a long term goal in the floodplain, it is not sustainable because of the continuous risk of flood. The state is the owner on the 80% of the 300 ha arable land and the national park manage this area. They try to convert it gradually to natural forest and grassland, but a certain part is rent by private farmers by now.

On the southern part of the floodplain, near to the river about 250 ha is a so called closed garden. The small parcels are in private ownership. Formerly the people cultivated orchards and vegetable gardens here. Some of them lived here during the whole year. Nowadays most of the area has been abandoned, but some owner try to manage it intensively, using chemicals and irrigation. The national park endeavors to by the abandoned gardens, and to establish traditional extensive orchards or natural forests here. It is a common problem, that the land owners often try to drive to their garden by tractor on the wet soil, and wade the protected area. The national park plans to build a good quality road in order to prevent this disturbance.

Regarding hydrological management, there is an extensive channel system on the area. The national park tries to use this system for developing a special ancient way of floodplain farming the so called "fökgazdálkodás". The base of this method is the controlled spreading of the flood, and driving back the water to the river after the flood. The national park has won a tender, and built an artificial flood gate in order to drive the water such a way. This work is mentioned as "habitat reconstruction programme". Unfortunately, in 2005 the hydrological work was destroyed by the flood, and the private farmers blamed the national park because of the destruction caused by the flood.

Features of the conflict

To understand the conflict it is necessary to know that most local feel that since the political transformation (of 1989) local economic opportunities have narrowed down seriously in the region. We find no more traditional factories, plants nowadays. Also, there is no market for local products and people buy the lower quality import products in the multinational supermarkets. A few hectares of land which used to be enough to support a family earlier is not enough anymore. The destruction and the privatisation of the system of agricultural cooperatives have ruined agricultural opportunities, because it would be absolutely necessary for the farmers to stand together instead of being divided. Unemployment rates are high in the area, farming can only provide less people with a living. Thus locals, mostly youth, feel to be forced to move to nearby cities, mainly to Makó to find a job. The population, partly because of the aforementioned reasons, is aging, young people seek opportunities elsewhere. This bad economic situation leads to spread of petty crime, people steal for a living. This means that the conservation program of the KMNPI is being carried out in an already pessimistic community hit by bread-and-butter worries and a strong perceived decline in well-being and economic opportunities.⁵

„The rate of unemployment is 60% in the area. The main source of income is agriculture, and seasonal agricultural work.” V1

„A lot of people steal for a living: stealing wood, poaching and snail picking... It would be necessary to provide employment opportunities for the people because it would reduce these forms of crime, especially the stealing of wood.” V1

„It's hard to sell agricultural products. People prefer to buy cheap, low quality products in the hypermarkets. This makes it more difficult for farmers to sell their products. Raising livestock is not worth anymore, people just keep as many pigs as they need for themselves. In the past 10 hectares of land was enough to live like a king, now it's hardly even enough to get by.” V3

„Bökény used to be cottar village where most of the population worked in agriculture. Each household had a cow. People kept working in agriculture during the time of the communist era, in the cooperative everyone had something to do and everyone knew what to do. By today most people have either moved to an

⁵ Economics often uses objective and subjective indicators to assess the general well-being of individuals and societies. While objective indicators are factors that affect well-being (such as income, state of health, job opportunities), subjective indicators show the perceived well-being (people's opinion on their own happiness and satisfaction) (Stiglitz *et al.* 2009). The study described in this paper does not analyze the factors affecting general well-being in the area (e. g. rate of unemployment), only the subjective well-being outlined in the interviews.

other place or died. Lands have been sold. The smaller pieces of land were bought by one person or an other or the national park. Those who stayed are mainly pensioners. Today there is only one old men who still keeps cows: Imre Molnár, he is 70.” V4

„In principle the village has a good agricultural potential but after the democratic transformation its system has changed and people can't really find any good source of income in the neighbourhood. With the transformation work opportunities in local factories disappeared, there are no more jobs in the local food-processing plants. There is no more livestock production and less land is owned by the government which can be maintained by less equipment.” V7

„People mostly work in agriculture, but it's a poor village, unemployment is typical.” V9

„Bökény is an aging village. Many people move away, there is a lot of old people. The empty houses are bought just to be used as weekend cottages, the village is dying out. In the past agriculture used to provide a living but today it is less and less worth it.” V16

„There are many abandoned houses in the village. The village is aging, there are a lot of highly qualified people among the young ones, teacher, vet, doctor, engineer. But everybody moves away. The population is quickly decreasing. It used to be 3000 people, today it's 1540... In the past it used to be a very rich village that's why there are so many nice and big houses here, partly abandoned.” V17

„There are 72 abandoned houses in the village. The village is aging. People in this „affluent society” have become poor, they are not able to maintainan their houses, they wear old clothes. V21

The conservation management and habitat reconstruction programme is realised in this environment that, according to our subjects, generates serious local conflicts. The origin of the conflict is the conservation management program of the Körös-Maros National Park (KMNPI) meaning a serious problem for several reasons to locals or a group of locals. One of the fundamental reasons is that the programme of the KMNPI results in land aquisitions from the part of the KMNPI and also land use limitations because of environmental reasons. These lead to even less and harder farming opportunities. Because the program deals with the lands in the flood plain, the conflict occurs to a different extent in the different villages and affects the different groups within the village (e.g. different profession) to a different extent. The conflict peaks in the Bökény area so Apátfalva and Nagylak are less involved, while Magyarsanád is a lot more.

„The owners of the lands in the floodplain are on bad terms with the national park. The other owners cooperate with them.” V5

„There are small gardens in the flood plain where people grow vegetables. ...The protected areas are far from Apátfalva, so we are not really involved in this problem” V7

„I do farming for a living. I produce parsley. I have been living here since I was born, next to the dike. I have a firm opinion about the rangers. they hinder me in work.” V13

„Most of our land is next to the forests of the hunting association or the lands of the national park. The latter ones suffer a lot of damage by game. But we only use mechanical protection, as we are forbidden to use chemicals. We are in conflict with the hunting society and with the national park because of these damages. For example time of mowing and the nestling period of certain birds has to be in a different time, we have already adapted to this.” V15

„There is a serious conflict in the flood plain peaking mainly in Bökény. The source of the conflict is the regulation by the National Park. Some doesn't want to comply with these regulations. The resulting conflict peaks in Bökény because people live next to the controversial area instead of just visiting it from time to time.” V12 farmer

The problem related to the activities of the national park is a multifold one. The organisation obstructs the economic opportunities of the area by restricting farming opportunities. The rate of the negative judgement about the national park is augmented by the fact that the given area has a particularly low population retention capacity, high unemployment rate, it's aging and has to fight serious social issues as well.

„Mowing is only permitted after the 15th of June but animals don't eat that grass anymore by then. We suffer a great loss due to the restriction.” V13

„There is a lot of beautiful forests in the area. I don't agree with their treatment. Grasslands and meadows could be exploited, they are suitable for grazing but the national park doesn't do it in the proper way. They let the area get spoiled. We see things from a different point of view... During the socialist times after cutting a forest new ones were planted, hybrid forest of soft-wood. Those are exotic species and today the national park tries top lant oak instead of these forests. Invasively spreading desert false indigo is a lot of trouble, it needs constant eradication... It's a serious problem that the national park plants oak in the place of the soft-wood plantations. The national park should also bring economic profit and an oak forest doesn't produce any, only on the long run and the seedlings need much more care.” V4

„Conservationists interfere with our lives unnecessarily. They obstruct my daily work. Agricultural opportunities are narrowing down wich is a serious problem to smallholders. There is less and less work. There are several evident problems with the activities of the national park. Logging and planting the seedlings in january, the restriction on deer and pheasant hunting. the destruction of the roads, chemicals can only be used with a permission...and I have never seen a Drobaica banatica snail” V13

„.... I would push for the use of floating timber. The poor could also get some firewood, the river would become cleaner and sand extraction would become

easier too. Of course it is forbidden to remove floating timber because of the reproduction of insects.” (ironically) V9

„In the past there was a deal between nature and people, nature also got its share but people could also use the land. Today they want to protect everything only for nature.” V21

A further problem besides the narrowing economic opportunities is that some don't see the environmental benefits of the area's treatment by the national park. One of the reasons is that to many locals the „original”, „good” and „valuable” environment is an „ordered” one. These people have found the situation a lot better before the national park's appearance. According to them the landscape is „rather untidy” and „full of weeds”. They are not convinced about the environmental benefits of the national park's activities.

„10-20 years ago there was serious agricultural production in the flood plain but conservationists took over and today there is only weeds there. In the past the floodplain wasn't a protected area, in my opinion it was more organised and kept clean.” V9

„Nature is neglected in my opinion, as you can see there is indigobush everywhere. Formerly the flood plain didn't belong to the conservationists, so people used to take care of it but today it's neglected. I think they just can't take care of it themselves. This landscape isn't really such an experience for the visitors, Maros is the only color in the area.” V9

„I'm angry at the national park too. Before they took over the riverbank it was possible to go hiking or ride a horse there, now it is overgrown by weeds, it's impenetrable. Until then the two villages took care of it together, while today no one. There are several islands on the river Maros, some are smaller and some are bigger. It would be nice to have some tourism based on this, organise hikes, birdwatching tours but this would destroy nature so it has to be left alone to nature, untouched.” V20

„In the beginning many people leased a land from the national park but there were many floods, they got bored of it and the national park got the lands back. People can't lease anymore, while the national park clearly doesn't do anything with the lands. Nowadays everyone is stealing wherever they can, conservation authorities included. They (the conservation authorities) have become just like a state within the state. They impose fines but hardly do anything else... I used to prefer the floodplain when the forested areas were planted in a more organised way. One could walk as far as the Beka hill, ride a bicycle, car. Today it's so neglected that it's not possible to get out there anymore... Usable lands shouldn't be left uncultivated with the excuse of conservation, because that's what is happening right now. Of course, it's obvious that the use of chemicals should be eliminated and the character and soundness of the landscape should be preserved, this is important to me and to everyone I know, to all of us... Unfortunately the area seems to be neglected now, perhaps because there is no more felling of trees and

no more grazing. Conservation is important, it's obvious, it's just that I don't agree with the operation of national parks and other public nature, environment and landscape conservation agencies alike. These institutes have recently established themselves in the region and it seems that they are not doing their job, just take the government subsidies. The system of conservation institutes is a mafia. In the past, people used to solve these things on their own, they didn't have to be fined, but the water and forestry authorities used to look after their area better, too. I see that the area is deteriorating, the environment is more polluted, there are several examples of illegal dumping around the village because the landfill where they used to take construction waste is now privately owned and it is not being used for anything else or anything at all. Despite this, environmental management, is only about green taxes and fines until now, it isn't efficient at all. What the EU does is nothing but empty talk, it just makes suggestions and regulations. People, on their own level, if left alone could solve the problems related to nature much better." V10

Some think that the problem of weeds is a common responsibility of the national park and the farmers, the NP and farmers are also responsible for the resulting conflict.

„There is also trouble with those who let the weeds grow on the land they lease from the national park and suddenly decide to cut everything down. After the political transformation things have changed for the worse. The area looks like nothing has an owner which makes me sad." V4

„There are some weird guys among the farmers who don't accept the conservation regulations at all... V5

Some opinions are very critical towards intensive farming and the work of the national park as well. Traditional farming does no harm to nature but organically respects it – as opposed to both intensive farming and the conservation practices of the national park.

„Instead of destroying it, traditional land use sustains the land, the meadow. I'm proud of never having used a drop of chemicals on my land since the political transformation... I don't see a difference between nature and cultivated, grazed land, a land in sustainable use. The conservation authorities... just plant and kill the forest, they don't treat it well. I would only allow mature and sick trees to be cut down... Farmers look after nature on their own will." V19

A lot of locals expressed their respect for nature conservation as an ambition but according to them, KMNPI doesn't do it in the right way. In other words, these critics are not speaking against conservation in general, but rather critical towards the particular activities of the national park in the area. For instance, expelling locals is a real problem and it is a serious source of conflict. Some think that the area is not utilized and a „reserve-only" conservation strategy is applied in a region that has been preserved in a state worth protection precisely by former local land use.

„I understand and support the matters layed down in the contract with the national park. For example if river Maros floods the crop we don't have to pay the leasing money... In the past we used to take care of the forest ourselves within the cooperative instead of the conservation authorities. The forests and paths used to be more organised back then. Today it's forbidden to cut down the trees, certain areas we used to look after are overgrown by weeds, I don't know, I don't see what conservation does at those places. The forest doesn't look normal, there are no proper cuts anymore... It's true that the national park doesn't allow us to fell the trees, but perhaps they are right, I don't know. I'm not angry at them, I leave such matters to them.” V11

„They have bought the road as well and because of the afforestation it is impossible to enter the area. Planting native trees is a good thing but now it is impossible to enter the forest. And the river bank would be so beautiful if there was an access to it and an educational path. It is forbidden to fish too. This is doesn't support hiking and discovering nature which is bad, although I don't want to defend anglers because they usually leave a lot of rubbish behind. This „Do not step on the grass!” strategy is bad tactics.” V8

„Conservation is important but I would do a lot of things in a different way... Protecting nature is a good thing and it's important too, but it has to be something rational: a bird shouldn't have more rights than a human, for example!” V9

„It's nice, it's a positive thing (the goals of the conservation authorities), but they are very authoritarian... It isn't rational what they are doing... I'm not angry at them, I always try to come to an agreement, to find a compromise. How can you live with your neighbour like this?! We walk the same sidewalk. But it still hurts me a bit that I can't go to my land on the road that my family took from generation to generation because it has become part of the national park.” V3

„I have a land along the river in the flood plain, but I would give it up if I could get a proper compensation for it and if the national park would use it well. This is a flood plain, it is not a place for production.” V8

Besides all this, a number of subjects have mentioned positive results of the KMNPI's activities that reaches beyond conservation – it affects employment for example. Some said that they were happy to sell their land to the national park.

„Protected areas are good, the ancient environment should be reconstructed. We have to take care of plants and animals. Birds need protection, we must respect every living creature. Parsley likes the soil here. Magyarsanád, Makó is the heart of parsley. Conservationists do it well!.. Aforestation provides jobs, the regulations make our everyday life harder.” V6

„The national park and the hunting society provide people with a living. The area of the national park is 3000 hectares and the hunting society has 1800 hectares.” V5

„I have sold my lands in the flood plain to the national park. May it have trees that won't be cut... I'd better sell my products with bugs inside than using

pesticides. We don't need much, just to slowly collect some income for our basic needs." V6

„Aforestation is a good thing but the lands where they have just planted those forests would make a very good ploughland." V17

Thus the basic conflict can be caught in the fact that certain ecosystem services providing direct profit and basic (personal and communal) subsistence are lost to the local community as a result of the activities of the KMNPI. These are principally provisioning services but due to further constraints of land use some recreational and touristic services also belong here. Moreover, some locals do not perceive that there would be any new ecosystem services (related to conservation) appearing in turn nor can they see a rise in the quality of other ecosystem services. Others perceive the benefits of conservation but they see it as a result of a trade-off which means that the community has to give up on certain provisioning services.

The conflict is deepened by, as revealed in the above quotations, that a number of locals see the national park as an outsider without any familiarity with the place without any interest in local opinions or knowledge.

„Their work (the work of the conservationists) isn't just needless but it's also harmful to the environment. They act without thinking instead of asking the farmers about the circumstances..." V13

„Local people love, respect and value their environment but they often don't understand the work of the national park and this leads to minor conflicts. Unfortunately low income doesn't always allow for a sustainable life style." V16 f

„The maintenance of the national park isn't transparent. In the past animals and plants weren't protected, but they are still here... Conservationists don't try to help the farmers, they just keep repeating their own point." V13

Furthermore, many people think that the national park waste a lot of money (does not use its resources effectively) even though their activities do not bring a short term profit. Consequently they see the national park as an organization which is indeed most of all interested in maximizing its own profit and not in nature protection.

„The national park gets a lot more money than the water authorities. Conservation today is the deepest well in the country, it just keeps swallowing our money without any profit." V4

„The conservation authorities are just wasting money. The hunting association could also provide conservation. The economy of the national park is bad, more money should go for conservation itself and not into their hands. Our national values such as game should be protected. Because the price of a partridge is 8000 HUF Italians would only be shooting partridge, but there is no partridge, it can't be bred because the pheasant breeding station was closed because pheasants eat protected animals... We try to maintain a good relationship with

the national park but I don't like them. But we cooperate with the ranger... There is no need for a national park to take care of a forest, an old farmer could do the same for a lot less." V14

„Landscape protection is just empty talk and it leads nowhere. For example there is a lake near Bökény on a higher elevation than the bottom of the Maros so it dries out from time to time. Those smart guys decided to pump up water from the Maros there so that the birds can have water all year round. They built a channel and a lock, spent a lot of money and took a big part of the subsidy from the EU to their own pocket. But even the most stupid peasant saw that the lock gate wasn't built properly and that river Maros was going to destroy it. So it happened. The water came up in the channel and flooded lands that the floods didn't reach in the past and in the end there was no water left in the lake either... Landscape protection generates conflict between farmers, buys land but does the same as farmers: they cut trees, the purpose of planting trees is production and they even use pesticides... There is a lot of weed because landscape protection doesn't allow much mowing or grazing and there are so many mice and hamsters because the hunters have shot the foxes. It's nature's balance that should be kept, there is too much intervention. In Romania this is much more natural, there is grazing, that's why the bank of the river Maros is so nice, people go camping and enjoy nature. And thanks to grazing meat has a higher quality, too." V8

„They undertake unnecessary and costly investments, For example building the lock gate that cost a lot of money but isn't being used properly. Or the limitation of mowing. In the past no chemicals were used, farmers did harvest by hand, but today this isn't worth anymore. Everyone works with machines and a lot of chemicals... Mowing is only permitted after the 15th of June but animals don't eat that grass anymore by then. We suffer a great loss due to the restriction." V13

Regarding the attitudes related to the national park and its activities we can state that they range from absolute support (fewer subjects) through highly critical but more or less tolerant attitudes to total rejection.

Summary: layers of the conflict

The so-called circle of conflict is a proper tool for the structured assessment of conflict situations (Fig. 5). This conflict typology is suitable for the identification of the conflicts resulting in deteriorated relations. Furthermore, it can bring to light possibilities of conflict prevention and resolution.

According to the diagram above, a value conflict occurs when good or bad, nice or ugly, right or wrong is perceived in a different way by different stakeholders. This difference leads to a conflict if one party tries to force its own scale of values on the other or stands for a value system that is unacceptable by the other party. Relationship conflicts develop when the stakeholders have strong negative feelings towards each other. Information conflicts stem from the lack of

information, incorrect information processing, incorrect communication or different interpretations of available data. Structural conflicts are often the result of limiting factors independent of the stakeholders, such as distance or time limitation, organisational structure, difficulties in organizing etc. In an interest conflict there is a competition between the parties for different goods, for tools to accomplish their needs. The participants of this kind of conflict typically feel that their interests can only be achieved at the expense of the other party (Kalóczkai 2009).

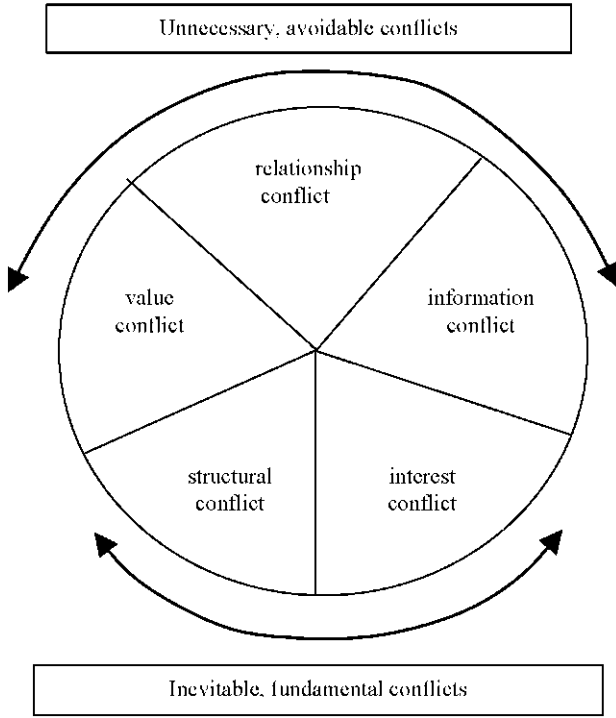


Figure 5. Circle of conflicts. Source: Kalóczkai 2009

According to the theory of the circle of conflicts value, relationship and data conflicts are relatively easy to avoid or to resolve, while structural difficulties and conflicts of interest lead to real, inevitable conflict situations and their occurrence is just a matter of time.

By applying the typology of the circle of conflict in the situation we examined in our research, we can state that all the five conflict types occurred. Exchange between different ecosystem types (and the loss of certain ecosystem types) can be regarded as an interest conflict. While the national park's interest is

habitat reconstruction, it's the capitalisation of provisioning services, recreation and tourism which are most important for most locals. Thus the stakeholders feel: the different services can not be achieved at the same time, there is an exchange between the two.

This conflict of interest is further augmented by several other conflict types. One of them is that a significant part of the local population perceives the national park as an organisation with a main interest in material profit instead of conservation. This problem might have several reasons. It is possible – although we haven't met concrete references in our survey – that it stems from a structural conflict. Previous studies (Málovics and Kelemen 2009, Bodorkós and Mertens 2009, Kelemen *et al.* 2009) have shown that national parks are under a serious pressure from their sponsors (government) to generate steady profit.

The conflict is a potential information conflict as well because the „observations” in the local community related to KMNPI might also occur due to the insufficient information flow. It is also evident from the interviews that several subjects find the information and informing processes of the national park insufficient. These subjects feel that the national park doesn't communicate with them. Not only is the park uninterested in their opinion but it fails to inform them about the sense of the conservation program. The latter one might be the reason, among other things, why locals question the meaning of the conservation program, why they don't see its environmental benefits. A value conflict also contributes to this opinion. Our interviews show that to locals a „nice”, „enjoyable”, „natural” landscape doesn't necessarily refer to a situation after a habitat reconstruction but to a „proper” landscape, used and cultivated by humans. All the above conflicts lead to serious relationship conflicts: to a situation where a part of locals is already hostile towards the national park and the habitat reconstruction program.

Strenghts and limitations of the approach

As previously mentioned, we have been using a qualitative methodology, conducting semi-structured in-depth interviews choosing our subjects with the help of snowball sampling. During the research the strenghts and limitations of our approach have become increasingly clear.

One of the most important strenghts of our methodology lies in its indirect character: our subjects were unaware of the aim of our research and that we are particularly interested in their value judgements regarding nature. This allowed for the emergence of unexpected topics and unexpected observations and resulted in a relative openness about the KMNPI and their conservation activities allowing for occasionally even heavy criticism from the part of the locals. Thus we think that our method is suitable for revealing and understanding local conditions, conflicts and people's relation to ecosystem services. The information collected

could serve as a basis for conflict resolution techniques. Also, by understanding the different layers of the environmental conflict, our results could lead to the revision of conflictual local/Hungarian conservation practices.

It has also become clear that our methodology has some serious limitations. Our sampling technique – the snowball method – only, but at least mainly, brought us to the local „elite”. Thus, besides the inevitable occurrence of the reliability/generalization problem, we also had to take into account that the „sound” of certain groups/levels may remain completely unnoticed in our study.

A further serious limitation of our method is that it can not contribute on the proper understanding of the effects of land use on biodiversity, nature or landscape. The reason is multifold. It is partly because interviewed people have a different view of landscape (think of nature on a different scale) than the one an ecologist has to deal with in a given scientific research. In this research we had the „luck” of partly overlapping research sites with a team of ecologists and because most of our subjects found the topic of the conflict interesting they talked a lot about those are. This, however (1), is not necessarily sufficient to understand the effects of previous land use on the current state of landscape, because farmers generally spoke about the present and the conflict and (2) it is just a result of a coincidence, thus in different cases lacking a conflict this method does not necessarily provide substantive information on land use in the given area. Thus to gather substantive information about the effects of previous land use on the current state of a landscape the use of more direct methods may be necessary. Historical data are crucial in understanding landscape dynamics and in planning nature conservation management. It is generally accepted, that traditional ecological knowledge completes scientific ecological knowledge efficiently in the solution of nature conservation issues. Traditional knowledge seems to be relevant especially at local scales. Only an ecologist who knows well the ecological characters of the studied landscape can accomplish an effective collection of traditional ecological knowledge. If they do not undertake this job they will have to rely upon the collection and publications of social scientists and probably would not notice accidental false data, misconceptions and, particularly, thematic and lexical gaps in the collection. (Molnár *et al.*, 2009)

Employing university students – as the third main limitation of our method – might already result in collecting data with a lower quality than it would be possible with skilled sociologists. According to the results of this study however, to understand the effects of land use on the current state of a landscape it is not enough to employ sociologists but also research fellows who have suitable and sufficient knowledge in the field of ecology in order to be able to document the information heard about the landscape out in the field.

Conclusion

This paper attempts to reveal how local stakeholders perceive the natural environment they live in, what they find valuable and important for their "well-being" and life. It aims to assess the ecosystem services perceived by locals and to understand the relation of locals to these services.

Based on our research we can conclude that locals give a key importance to those provisioning and cultural services that affect their welfare directly. We found that the most important provisioning services were the services related to food production as they affect the existential situation of locals directly, while tourism, recreation and sense of place turned out to be the most appreciated cultural services.

Although it wasn't the original aim of this study, our research revealed a serious environmental conflict between certain groups of the local community (firstly but not exclusively farmers) and the national park triggered by the conservation program of the park. The issue is formed basic around conflicting interests but knowing previous Hungarian research and case studies, it is highly probable that there are also deep structural causes in the background. Further value and information conflicts appear that easy to avoid according to literature but also provide a basis for a serious relationship conflict. The environmental conflict revealed in this paper is not an isolated case in Hungary. Previous research (Málovics and Kelemen 2009, Kelemen *et al.* 2009, Bodorkós-Mertens 2009) has revealed other, similar cases of conflict (habitat reconstruction by national park on Natura 2000 area) at various sites in Hungary.

Finally we can conclude that the indirect aspect and the feature that allows for unexpected observations make our method suitable for assessing local conditions, conflicts and people's relation to ecosystem services. It can provide a basis for the application of conflict resolution techniques and the revision of local/Hungarian conservation practices. However, due to the sampling technique of the snowball method, the opinion of certain stakeholders remains „invisible” to our analysis. Furthermore, our method can not reveal the actual (past and present) effects of land use on biodiversity, nature or landscape, partly because the view of landscape perceived by locals differs from the one an ecologist has to deal with in a given scientific research. According to the results of this study however, to understand the effects of land use on the current state of a landscape it is not enough to employ sociologists but also research fellows who have suitable and sufficient knowledge in the field of ecology in order to be able to document the information heard about the landscape out in the field.

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Appendix

A draft interview for the fieldwork around Magyarcsanak

1. Personal livelihood, farming, activities:

- Please, tell us about yourself. How long have you been living here and what do you do for a living?
- Could you tell us about your job? (The point of this question is to let the subject talk freely about their life and work. We meet various different kinds of people, everyone has to be encouraged by slightly different questions. See the following examples of some possible questions to a farmer, a member of an NGO and a river-watcher.)
 - Farmer:
 - What do you produce?
 - How do you produce it (pest control, tilling etc.)?
 - How did you start farming and when?
 - How did people use to live in the past? (How about farming in the past?)
 - What kind of natural forces you need protection from?
 - Member of an NGO:
 - When was the society founded?
 - What is the purpose of the NGO?
 - Since when have you been participating in their work?
 - How did it all start?
 - How does the organisation work?
 - River-watcher:
 - How long have you been working as a river-watcher?
 - Is fishing typical source of income in the area and how typical is it?
 - What about angling?
 - What have changed about people's habits related to fishing and angling?
- What is life in Tiszaalpár/Lakitelek etc. like? (What do people do generally? What do they work?)

2. Local natural values:

- Please, tell us about nature in the area, and about the environment.
- What features make this area so special, valuable and useful?
- What kind of farming is this land suitable for?

- What are the features, elements of the landscape (plants, animals, relief, hydrology, climate etc.) that would seriously affect your everyday life if it disappeared?
3. Changes of the natural environment:
- How has nature changed since the time you can remember it?
 - Do you remember significant events when natural disasters (storms, floods etc.) caused serious damage to locals in the area?
 - What reasons do you think there are behind these changes?
 - How do these changes affect your daily activities and life?
 - How can you adapt to them?
 - How do you think this landscape is going to change in the future?
 - How would you like it to change?